



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/985,676	11/05/2001	Pankaj Patel	0023-0056	3995

44987 7590 12/02/2005

HARRITY SNYDER, LLP
11350 Random Hills Road
SUITE 600
FAIRFAX, VA 22030

EXAMINER

ISMAIL, SHAWKI SAIF

ART UNIT PAPER NUMBER

2155

DATE MAILED: 12/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/985,676

Applicant(s)

PATEL ET AL.

Examiner

Shawki S. Ismail

Art Unit

2155

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 September 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

RESPONSE TO AMENDMENT

1. This communication is in response to the amendment received on September 6, 2005. Claims 1-23 are pending further examination.

The Old Rejection Maintained

2. The rejection is respectfully maintained as set forth in the last Office Action mailed on June 3, 2005. Applicant's arguments with respect to claims 1-23 have been fully considered but they are not deemed to be persuasive and therefore, the old rejection is maintained.

Claim Rejections - 35 USC §102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

4. Claims 1-23, are rejected under 35 U.S.C. 102(e) as being anticipated by **Ferguson et al.**, (Ferguson) U.S. Patent No. **6,798,777**.

5. As to claim 1, Ferguson teaches a method of performing route lookups for a plurality of data, comprising:

processing, by a processor, a first data to generate routing information until first information is needed (col. 2, line 64 - col. 3, line 11);

requesting the first information (col. 2, line 64 – col. 3, line 11);
storing first context state information for the first data (col. 4, lines 16-33);
processing, by the processor, a second data to generate routing information until
second information is needed (col. 2, line 64 – col. 3, line 11);
requesting the second information (col. 2, line 64 – col. 3, line 11);
storing second context state information for the second data (col. 4, lines 16-33);;
and
resuming processing, by the processor, on the first data using the stored first
context state information after the requested first information is received (col. 4, lines
16-33).

6. As to claim 2, Ferguson teaches the method of claim 1, further comprising:

receiving the requested first information from memory.

7. As to claim 3, Ferguson teaches the method of claim 2, wherein said processing
of a second data is performed before said receiving the requested first information (col.
3, lines 9-11).

8. As to claim 4, Ferguson teaches the method of claim 2, further comprising:

processing, by the processor, a third data to generate routing information until
third information is needed (col. 2, line 64 – col. 3, line 11), and

processing, by the processor, a fourth data to generate routing information until
fourth information is needed (col. 2, line 64 – col. 3, line 11),

wherein at least one of said processing of a third data and said processing a fourth data is performed before said receiving the requested first information (col. 3, lines 9-11)

9. As to claim 5, Ferguson teaches the method of claim 1, further comprising:

determining which data to process next when information is needed (col. 2, line 64 – col. 3, line 11),

10. As to claim 6, Ferguson teaches a method of processing for routing packets, comprising:

processing a first data related to routing of a first packet until first information is needed (col. 2, line 64 – col. 3, line 11),;

requesting the first information (col. 2, line 64 – col. 3, line 11);

storing intermediate information related to the first data (col. 17, lines 22-45); and

processing a second data related to routing of a second packet while waiting for the requested first information to arrive (col. 2, line 64 – col. 3, line 11).

11. As to claim 7, Ferguson teaches the method of claim 6, further comprising:

processing the first data based on the stored intermediate information and the first information (col. 17, lines 22-45).

12. As to claim 8, Ferguson teaches the method of claim 6, further comprising:

determining which of the plurality of data to process next when information is needed (col. 2, line 64 – col. 3, line 11).

13. As to claim 9, Ferguson teaches a method for routing packets of information using corresponding data structures, comprising:

receiving a plurality of data structures related to the packets of information (col. 12, lines 50-60);

sending the data structures to a plurality of processing engines, data structure corresponding to a different packet of information (col. 12, lines 50-60);

performing, at each processing engine, concurrent route lookups for at least two of the data structures at a time (col. 12, lines 50-60); and

modifying the data structures based on the route lookups (col. 17, lines 22-45);
and

routing the packets of information based on the modified data structure (col. 17, lines 22-45).

14. As to claim 10, Ferguson teaches the method of claim 9, further comprising:
forwarding the modified data structures (col. 17, lines 22-45).

15. As to claim 11, Ferguson teaches the method of claim 9, further comprising:
conducting accounting, filtering, or policing functions on the data structures during said performing step (col. 14, lines 1-7, and col. 2, lines 40-54).

16. As to claim 12, Ferguson teaches the method of claim 9, wherein said performing includes:

performing, at each processing; engine, concurrent route lookups for four different data structures (col. 12, lines 50-60).

17. As to claim 13, Ferguson teaches a network device comprising:

an input portion configured to receive data structures and to transmit data items associated with the data structures (see Fig. 2b, col. 5, line 61 – col. 6, line 13);

a plurality of processing engines, each processing engine being configured to receive a plurality of data items from the input portion and to contemporaneously compute routes for the plurality of data items (see Fig. 9, col. 14, lines 8-27);

a resource configured to receive requests from the plurality of processing engines ((col. 12, lines 50-60); and

a result processor configured to modify the data structures based on the routes computed by the plurality of processing engines (col. 17, lines 22-45).

18. As to claim 14, Ferguson teaches the network device of claim 13, wherein each of the plurality of processing engines includes multiple context-switched engines (col. 12, lines 50-60).

19. As to claim 15, Ferguson teaches the network device of claim 13, wherein the memory includes random access memory (col. 11, lines 48-63).

20. As to claim 16, Ferguson teaches the network device of claim 13, wherein each of the plurality of processing engines includes:

a data processor configured to calculate a route for one key at a time (col. 14, lines 1-27),

a functional control state machine configured to control operation of the data processor (col. 13, lines 4-67), and

a context buffer configured to store a partially calculated route from the data processor and a processing state from the functional control state machine (col. 14, lines 28-46).

21. As to claim 17, Ferguson teaches the network device of claim 13, wherein each of the plurality of processing engines further includes:

a context switch controller configured to cause the data processor and the functional control state machine to respectively store the partially calculated route and the processing state in the context buffer when the data processor requests data from the memory (col. 13 lines 4-67).

22. As to claim 18, Ferguson teaches the network device of claim 13, wherein each of the plurality of processing engines further includes:

an output buffer configured to store a fully calculated route for output to the result processor (see Fig. 3, output buffer 312).

23. As to claim 19, Ferguson teaches a system for performing route lookups for processing a plurality of data items, comprising:

a data processing portion configured to process one data item at a time and to request data when needed (col. 2, line 64 – col. 3, line 11);

a buffer configured to store a partial result from the data processing portion (col. 17, lines 13-45); and

a controller configured to load the partial result from the data processing portion into the buffer and to input another data item into the data processing portion for processing while requested data is obtained for a prior data item (col. 22, lines 13-25).

24. As to claim 20, Ferguson teaches system of claim 19, further comprising:

an output buffer configured to store a completely processed data item from the data processing portion (col. 1, lines 56-67).

25. As to claim 21, Ferguson teaches the system of claim 19, further comprising:

an input buffer configured to store a plurality of data items to be processed by the data processing portion (col. 1, lines 56-67).

26. As to claim 22, Ferguson teaches the system of claim 19, wherein the data processing portion includes:

a data processor configured to determine a route associated with a data item (col. 43 line 58 – col. 44, line 7), and

a state machine configured to interact with the data processor and to inform the controller when the data processor will request data from the memory (col. 43 line 58 – col. 44, line 7).

27. As to claim 23, Ferguson teaches a system, comprising:

means for processing data structures to generate routing information and for requesting information (col. 2, line 64 – col. 3, line 11);

means for storing intermediate products from the means for processing while waiting for requested information (col. 17, lines 22-46); and

means for loading the intermediate products into the means for storing and loading a data structure into the means for processing when the means for processing requests the information, and for loading the intermediate products into the means for processing after the requested information arrives (col. 17, lines 22-46).

Response to Arguments

28. Applicant's arguments with respect to claims 1-23 received on September 6, 2005 have been fully considered but they are not deemed to be persuasive.

29. In the remarks, the applicant argues in substance that:

(A) Argument: Ferguson does not disclose the combination of features recited in claim 1.

Response: Ferguson teaches a method and apparatus for performing a lookup in a switching device of a packet switch network. Identifying a first lookup operation in a sequence of lookup operations to be performed on a packet executing the first lookup operation including returning a result that is a pointer to a subsequent lookup operation in the sequence, executing the subsequent operation and continuing to execute lookup operations in the sequence until a lookup operation returns a result that indicates that no more operations are to be processed and then returning the routing information to for the routing of the packet through the switching device. Ferguson teaches the processing of first data to generate routing information and second data to generate routing information and therefore meets the scope of the claimed limitation (col. 2, line 64 – col. 3, line 11).

(B) Argument: Ferguson does not disclose performing, at each processing engine, concurrent route lookups for at least two of the data structures at a time, as required by claim 9.

Response: Ferguson teaches that a plurality of route lookup engines are included in the controller, each receiving lookup request in round-robin fashion so as to speed the

routing process. A plurality of route lookup engines are therefore able to handle concurrent rout lookups for a plurality of data structure and thus meets the scope of the claimed limitation (col. 12, lines 50-60).

(C) Argument: Ferguson does not disclose a result processor configured to modify the data structures based on the routes by the group of processing engines.

Response: Ferguson teaches that the key engine 905 stores the result of packet processing which is information on how the packet should be forwarded in the result buffer 904. Ferguson further teaches that allowing the modification of the contents of the result buffer 904, intermediate results can be stored. If not modified by a subsequent lookup step, the intermediate results, or some field from it, may eventually form the final result. Ferguson modification of the resultant buffer meets the scope of the claimed limitation (col. 17, lines 22-45).

30. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

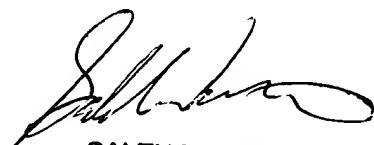
Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shawki S Ismail whose telephone number is 571-272-3985. The examiner can normally be reached on M-F 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Saleh Najjar can be reached at 571-272-4006. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Shawki Ismail
Patent Examiner
November 26, 2005



SALEH NAJJAR
SUPERVISORY PATENT EXAMINER